

**GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY
PREVENTATIVE MAINTENANCE PLAN IMPLEMENTATION
PROCEDURE TO PRIORITIZE AREAS FOR INSPECTION
2/6/12**

SEWER SERVICE AREA MAP AND SPREADSHEET

- Area number, name and municipality
 - New Haven – 76 areas – 275 miles
 - Hamden – 60 areas – 175 miles
 - East Haven – 39 areas – 100 miles
 - Woodbridge – 4 areas – 10 miles
 - TOTAL – 179 areas – 560 miles
- Sewer type
 - New Haven
 - Sanitary – 28 areas
 - Separated – 28 areas
 - Combined – 20 areas
 - All sewers in Hamden, East Haven and Woodbridge are sanitary – 103 areas
- Tributary to
 - Boulevard Pump Station – 55 areas
 - East Street Pump Station – 52 areas
 - James Street Siphon – 14 areas
 - East Shore Water Pollution Control Facility
 - Via Barnes and Quinnipiac Pump Stations – 11 areas
 - Via Morris Cove Pump Station – 41 areas
 - Via gravity sewers – 6 areas
- Hot Spots
 - New Haven – 36 segments – 5.5 miles – includes 59 of 162 SSOs since 2005
 - Hamden – 37 segments – 9.3 miles – includes 44 of 126 SSOs since 2005
 - East Haven – 20 segments – 8.5 miles – includes 17 of 47 SSOs since 2005
 - Woodbridge – 3 segments – 1.2 miles – includes 0 of 2 SSOs since 2005
 - TOTAL – 96 segments – 24.5 miles – includes 120 of 337 SSOs since 2005

I/I & CSO LTCP PROGRAMS

- Areas included in the I/I and CSO LTCP Programs – 77 areas
 - New Haven Rehab (2009) – 1 area
 - New Haven SSES (2015) – 1 area
 - Hamden Rehab (2009) – 9 areas

- Hamden SSES (2013) – 5 areas
- Hamden Rehab (2013) – 7 areas
- East Haven I/I Study (2009) – 30 areas
- East Haven SSES (2013) – 3 areas
- East Haven Rehab (2013) – 2 areas
- East Haven SSES (2015) – 4 areas
- Woodbridge I/I Study (2012) – 4 areas
- New Haven Separated (1997 – 2008) – 8 areas
- New Haven Separated (2013) – 1 area
- New Haven Separated (2015) – 2 areas
- Programs include manhole inspections, sewer cleaning and television inspections that document maintenance and structural conditions using PACP ratings
 - Obtain and review inspection data
 - Address maintenance issues requiring immediate attention to remove blockages
 - Enter PACP ratings into CMMS
 - Generate reports
 - Tie data to GIS
 - Generate color coded maps
 - Assess the inspection data to identify problem gravity sewers
 - Clean problem gravity sewers to remove FOG, roots and debris

PAVING PROJECTS

- Coordinate with State and Municipal paving projects
 - 2011 State paving project – Dixwell and Grand Avenues
 - 146 manhole inspections completed
 - Use photos to assign maintenance and structural PACP ratings for each manhole and each sewer
 - Enter PACP ratings into CMMS
 - Generate reports
 - Tie data to GIS
 - Generate color coded maps
 - Assess the inspection data to identify problem gravity sewers
 - Clean problem gravity sewers to remove FOG, roots and debris

PRIMARY INSPECTION AREAS

- Focus on the following areas
 - New Haven sanitary sewers (not included in the I/I or CSO LTCP Programs)
 - New Haven sewers separated between 1988 and 1997
 - New Haven combined sewers not evaluated since the 2001 CSO LTCP

- Hamden sanitary sewers not evaluated since the 1993 I/I Study
- Perform manhole inspections in sewer areas based on the following criteria – 54 areas
 - Probability of failure
 - 4 or more SSOs since 2005 – 24 areas
 - Maximum velocities below 2 fps (cleansing velocity) – 15 areas
 - Sediment depth greater than 15% of pipe size – 15 areas
- Address maintenance issues requiring immediate attention
- Enter PACP ratings into CMMS
 - Generate reports
 - Tie data to GIS
 - Generate color coded maps
- Assess the inspection data to identify problem gravity sewers
- Clean problem gravity sewers to remove FOG, roots and debris

SECONDARY INSPECTION AREAS

- Focus on the remaining areas (not meeting the primary inspection criteria)
- Perform manhole inspections in sewer areas based on the following criteria – 24 areas
 - Consequence of failure
 - Large diameter pipes (greater than 30 inches) – 24 areas
- Address maintenance issues requiring immediate attention
- Enter PACP ratings into CMMS
 - Generate reports
 - Tie data to GIS
 - Generate color coded maps
- Assess the inspection data to identify problem gravity sewers
- Clean problem gravity sewers to remove FOG, roots and debris

TERTIARY INSPECTION AREAS

- Focus on the remaining areas (not meeting the primary or secondary inspection criteria)
- Perform manhole inspections in remaining areas – 24 areas
- Address maintenance issues requiring immediate attention
- Enter PACP ratings into CMMS
 - Generate reports
 - Tie data to GIS
 - Generate color coded maps
- Assess the inspection data to identify problem gravity sewers
- Clean problem gravity sewers to remove FOG, roots and debris



CH2M HILL New Haven Collections Department October 2013 Monthly Report

SEWER CLEANING

The total mileage of sanitary sewers cleaned for the GNHWPCA service area for October 2013 is **22.2** miles*.

There were 21.9 miles of preventative cleaning and 0.3 miles of corrective cleaning.

New Haven	0.3
East Haven	9.0
Hamden	12.9
Woodbridge	0

The total mileage cleaned was encompassing the service area of New Haven, East Haven, Hamden and Woodbridge.

*Total mileage includes any work orders carried over from the previous month. Also, the table below gives a more detailed breakdown of the cleaning history.

MILES OF SEWER CLEANED									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Haven	53.2	44.63	65.49	52.48	38.8	52.2	37.1	96.2	142.2
% System	21%	18%	26%	21%	16%	21%	15%	38%	57%
EHHW		66.59	20.93	37.86	96.4	103.8	139.9	64.8	63.3
% System		27%	8%	15%	39%	42%	56%	26%	25%
TOTAL	53.2	111.22	86.42	90.34	135.1	156	177	161	205.5
NH SSO's		60	26	35	22	22	17	15	9
EHHW SSO's		32	40	41	30	40	21	30	16
Total SSO's	58	92	66	76	52	62	38	45	25

Notes	2013 data through October 2013
	Last 3 Years NH % Complete 110%
	Last 5 Years NH % Complete 147%
	Last 5 Years EHHW % Complete 188%

Hocon here today to start the heat in the secondary tent.

GNH request, Quickfix complaint of a back up at 42 Goodyear, NH. Crew jetted the line, lateral issue.

10/9

One crew jetting in Hamden.

Repair to Big Red hydraulic drive motor was completed in house.

10/10

Three crews jetting.

10/11

Two crews jetting.

Camera truck demo.

10/14

Holiday.

10/15

Big Red to Superior Spring for DOT inspection.

Two crews jetting in Hamden.

One crew cleaned the dump pad and box.

Sink hole on George @ Howe.

10/16

Two crews jetting in Hamden.

One crew cleaned the CSO outfall MH on Orange Ave at the bridge.

10/17

Crew picked up Big Red from Superior Spring for the trucks DOT inspection.

Two crews jetting, East haven and Hamden hot spots.

10/28

Two crews jetting in Hamden.

Crews checked the MH covers on Howe from George to Chapel St GNH request.

10/29

One crew jetting in Hamden.

Crews checked the MH covers on Howe from George to Chapel St GNH request.

10/30

Two crews jetting in Hamden.

Crew cleaned the dump box area.

10/31

One crew jetting in Hamden.

One crew on CCTV inspections.

One crew cleaned the Annex Club line.

Crew checked the temp cover on N. Frontage @ S. Orange St, New Haven.

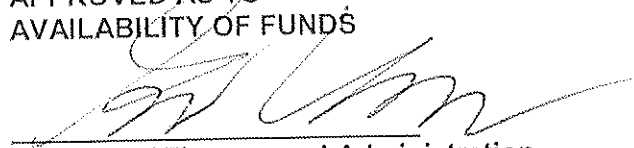


Greater New Haven Water Pollution Control Authority
 260 East Street New Haven, CT 06511
 203.466.5280 p 203 772.1564 f www.gnhwpca.com

December 5, 2013

Brian Gackstatter, P.E.
 CH2M HILL
 Water Business Group
 100 Great Meadow Road, Suite 107
 Wethersfield, CT 06109

APPROVED AS TO
 AVAILABILITY OF FUNDS


 Director of Finance and Administration

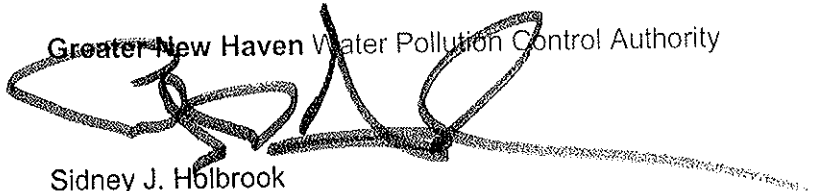
Re: On Call Engineering Services
Task Order CH2M 12 – West River CSO Abatement Study

Dear Mr. Gackstatter:

In accordance with our Professional Services Agreement effective as of April 26, 2010, this letter is Authorization for CH2M Hill to preliminary engineering phase services for the West River CSO Abatement Study. This Task Order is to develop a plan to reduce frequency, volume and duration of combined sewer overflows along the West River in New Haven.

CH2M Hill shall provide Services in accordance with the Scope, Tasks, Schedule and Staffing outlined within your proposal dated October 31, 2013 (attached). The amount of these services shall not exceed **One Hundred Forty Nine Thousand Eight Hundred Dollars and No Cents (\$ 149,800)**. Tom Sgroi shall serve as the Authority's manager for this project. If you have any question or require additional information regarding this Notice to Proceed, please contact him at 203 466 5280, Extension 328.

Very truly yours,


 Greater New Haven Water Pollution Control Authority

Sidney J. Holbrook
 Executive Director

cc: Gabriel Varca, Director of Finance and Administration
 Lou Criscuolo, Deputy Director of Finance and Administration
 Thomas Sgroi, Director of Engineering
 Gary Zrelak, Director of Operations
 Bruce Kirkland, Senior Engineer

GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY

**Agreement for Professional Engineering Services
Regarding On-Call Services**

***TASK ORDER:
West River Combined Sewer Overflow (CSO) Abatement Study***

Background

The following is a task order to the Agreement between the Greater New Haven Water Pollution Control Authority (GNHWPCA) and CH2M HILL for professional engineering services regarding on-call engineering services for wastewater treatment and major pump stations, energy, value engineering, green technology, and GIS dated April 26, 2010 and Amendment No. 1 dated October 21, 2013.

The purpose of this task order is to develop a Preliminary Design Report that develops a plan to reduce frequency, volume and duration of combined sewer overflows along the West River. CH2M Hill will provide the services described in the following sections.

Scope

This Task Order will provide services to develop a recommended plan that will:

- Eliminate CSOs to the West River from CSOs 006, 005, 004, and 003, by modifying or constructing new regulators, for rain events up to and including the 2 year 6 hour design storm (if possible)
- Maximize use of the Truman CSO storage tank
- Maximize pumping from the Boulevard pump station
- Maximize conveyance and storage in the Boulevard trunk sewer
- Increase CSOs to New Haven Harbor via CSO 024 (if necessary)
- Evaluate green infrastructure alternatives within the Boulevard trunk sewer tributary areas

The scope of this task order consists of the following tasks:

- Task 1 – Project Management
- Task 2 – Data Collection, Review and Analysis of Existing Data
- Task 3 – Preliminary Design Report

Task 1—Project Management

The purpose of this task is to conduct the project management activities required to manage all technical, financial, and schedule aspects of this task order necessary to complete work on time, within budget, and of suitable quality. Activities include coordinating and facilitating team and client meetings, coordinating quality assurance, coordinating subconsultants, monitoring the progress of the work, and assembling all documents.

Task 2—Data Collection, Review and Analysis of Existing Data

Task 2.1 Data Collection and Review

After the Notice to Proceed, CH2M HILL will conduct a kick off meeting with the client. CH2M HILL will collect and review the following data pertinent to hydraulic conditions of Boulevard trunk sewer including:

- CSO Flow Monitoring Program flow meter locations and data since June 2012
- Rain gauge locations and data since June 2012
- Hydraulic model, which includes Boulevard trunk sewer tributary areas
- GIS, which includes Boulevard trunk sewer plan and profile data
- Regulator, Truman CSO storage tank and Boulevard pump station as-built drawings
- Truman CSO storage tank SCADA data
- Boulevard pump station SCADA data
- Sediment depth estimates in the Boulevard trunk sewer
- Boulevard trunk sewer cleaning and CCTV inspection data (expected to be completed in 2014)
- USGS gauge data of river stages and NOAA tidal data since June 2012

Upon completion of data review, CH2M HILL will produce a figure that illustrates existing facilities and flow meter location.

Task 2.2 Analysis of Existing Conditions

CH2M HILL will perform data analysis to describe existing hydraulic conditions of Boulevard Trunk Sewer during selected wet weather events and to evaluate the correlations among Boulevard Trunk Sewer, CSO regulators, Truman Storage Tank and boundary water level (river stages and tidal elevations). Using data collected in Task 2.1, CH2M HILL will:

- Perform frequency analysis of storm events with CSOs activation (at CSOs 006, 005, 004, 003 and 024) by using intensity-duration-frequency (IDF) curve developed by Northeast Regional Climate Center (NRCC) and select up to five (5) principal events for hydraulic analysis;
- Develop schematic hydraulic profiles of Boulevard trunk sewer during the peak of selected storm events;
- Perform flow continuity analysis and compute conveyance capacity under various hydraulic conditions including:

- i. pipe full with sediment
 - ii. pipe full without sediment
 - iii. headwater surcharge at regulator weir crest elevation
 - iv. headwater surcharge at 1, 2 and 3 ft above regulator weir crest elevation
- Establish hydraulic relationship between CSO 003/004 and Truman Tank by perform regression analysis for the water levels at CSO 003, 004 and Truman Tank bending weir;
 - Delineate sewershed area tributary to Boulevard trunk sewer and perform preliminary planning level screening of potential implementation opportunities for green infrastructures based on sewershed imperviousness, soil and land uses data.

Task 3—Alternative Analysis & Preliminary Design Report

Task 3.1 Alternative Analysis

CH2M HILL will develop and evaluate alternatives including:

- Alternatives to modify the bending weir at the Truman CSO storage tank
- Alternatives to improve the Boulevard pump station
- Alternatives to modify or construct new regulators at CSOs 006, 005, 004, and 003
- A sensitivity analysis of removing the sediment from the Boulevard trunk sewer versus not removing it and the impact on the Recommended Plan
- Potential effects of green infrastructure implementation

CH2M HILL will conduct two workshops with GNHWPCA staff to discuss potential alternatives including feasibility, cost and CSO reduction benefits.

Task 3.2 Preliminary Design Report

CH2M HILL will prepare a preliminary design report that includes:

- Summary of data review and description and figures of existing facilities and flow meter locations;
- Description of analysis of existing data as listed in Task 2.2;
- Development and evaluation of alternatives including:
 - Alternatives to modify the bending weir at the Truman CSO storage tank
 - Alternatives to improve the Boulevard pump station
 - Alternatives to modify or construct new regulators at CSOs 006, 005, 004, and 003
- A sensitivity analysis of removing the sediment from the Boulevard trunk sewer versus not removing it and the impact on the Recommended Plan
- Description of planning level implementation opportunities for green infrastructure
- Recommended Plan that includes;

- 10% design drawings of recommended facilities
- A list of required permits to construct improvements
- Planning level (class 5) project cost estimate
- Implementation schedule

CH2M HILL will prepare a PowerPoint presentation describing the Recommended Plan and attend the public meeting to assist the Authority presenting it to the public.

Project Costs and Schedule

The lump sum costs for the Task Order are shown in Table 1, broken down by task. For services provided under this Task Order, costs have been calculated by CH2M HILL direct salaries, plus a percentage of direct salaries (overhead 170%), plus a fee percentage of 10% on labor. Expenses include direct expenses and outside services on a cost basis (no markup). A CT DEEP 5700 form is attached.

CH2M HILL will meet or exceed the CTDEEP Clean Water Funding of 3% MBE and 5% WBE participation goals for the project.

TABLE 1 Task Order Amendment Project Costs				
Task	CH2MHILL Labor	Sub-Contracts	Expense	Task Total
Task 1 – Project Management	\$14,000		\$1,000	\$15,000
Task 2 – Data Collection, Review and Analysis of Existing Data				
Task 2.1 Data Collection and Review	\$5,000			\$5,000
Task 2.2 Analysis of Existing Conditions	\$11,000			\$11,000
Task 3 – Alternative Analysis & Preliminary Design Report				
Task 3.1 Alternatives Analysis	\$61,800	7,500		\$69,300
Task 3.2 Preliminary Design Report	\$36,000	4,500		\$40,500
Task 3.3 Public Meeting	\$9,000			\$9,000
Grand Total	\$136,800	12,000	\$1,000	\$149,800

Schedule

Upon approval of the task order, CH2M HILL will complete the construction contract documents within 6 months from notice to proceed.

Cost or Price Summary for Professional Services Agreements

FORM

State of Connecticut - Department of Environmental Protection

5700-41

Water Management Bureau - Clean Water Fund Program

Greater New Haven Water Pollution Control Authority - West River CSO Abatement Study

1. Grantee - Greater New Haven Water Pollution Control Authority		2. Grant Number -		
3. 5. Name and Address of Contractor or Subcontractor CH2M HILL 100 Great Meadow Road Suite 107 Wethersfield, CT 06109		4. Subagreement Date		
		6. Services to be Furnished West River CSO Abatement Study		
7. Direct Labor (Specify labor categories)	Estimated Hours	Hourly Rate	Estimated Cost	TOTALS
Principle	8	\$80.00	\$640	
Project Manager	155	\$63.00	\$9,765	
Senior Technical Specialist	120	\$65.00	\$7,800	
Senior Project Engineer	120	\$55.00	\$6,600	
Staff Engineer	225	\$36.00	\$8,100	
Senior Admin. Assistant	40	\$26.00	\$1,040	
Senior CAD Operator	100	\$35.00	\$3,500	
Senior Computer Modeler	120	\$60.00	\$7,200	
Senior Cost Estimator	30	\$48.00	\$1,440	
DIRECT LABOR TOTAL:				\$46,085
8. Indirect Costs (Specify indirect cost pools)	Rate	x Base	Estimated Cost	
Labor Overhead	1.700	\$46,085	\$78,345	
INDIRECT COSTS TOTAL:				\$78,345
9. Other Direct Costs			Estimated Costs	
a. Travel				
(1) Transportation			\$1,000	
(2) Per Diem				
TRAVEL TOTAL:				\$1,000
b. Printing, Materials, Supplies (Specify categories)	Quantity	Cost	Subtotal	
(1) Field expense, relocations and allowances				
(2) Postage/FEDEX				
(3) Printing/Photos/Reproduction				
(4) Miscellaneous				
EQUIPMENT TOTAL:				\$0
c. Subcontracts (Specify firm & category)				
Zuvic Carr (WBE)			\$7,500	
Zuvic Carr (MBE)			\$4,500	
SUBCONTRACTS TOTAL:				\$12,000
d. Other (Specify categories)				
Traffic Control Allowance				
Flow Metering Extension Allowance				
OTHER TOTAL:				\$0
OTHER DIRECT COSTS TOTAL:				\$13,000
10. TOTAL ESTIMATED COST				\$137,430
11. FIXED FEE OR PROFIT				\$12,371
12. TOTAL PRICE Check one: <input type="checkbox"/> Cost plus fixed fee <input checked="" type="checkbox"/> Lump Sum <input type="checkbox"/> Other				\$149,800

14. CONTRACTOR INFORMATION

14a. Has a federal agency certified state or local agency performed any review of your accounts or records in connection with any other Federal grant or contract within the past 12 months?

☐ No

☐ Yes (Write name, address and telephone number of reviewing office below).

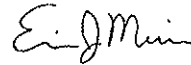
14b. This summary conforms with the following cost principals:

14c.

This proposal is submitted for use in connection with and in response to a proposal for a West River CSO Abatement Study for the Greater New Haven Water Pollution Control Authority. This is to certify the best of my knowledge and belief that the cost and pricing data summarized herein are complete, current and accurate as of October 31, 2013, and that a financial management capability exists to fully and accurately account for the financial transactions under this project. I further certify that I understand that the subagreement price may be subject to downward renegotiation and/or recoupment where the above cost and pricing data have been determined, as a result of audit, not to have been complete, current and accurate as of the date above.

October 31, 2013

Date of execution



Signature of proposer

Project Manager

Title of proposer

15. GRANTEE REVIEW

I certify that I have reviewed the cost/price summary set forth herein and the proposed costs/price appear acceptable for subagreement award.

Date of execution

Signature of reviewer

Title of reviewer

16. DEP REVIEWER

Date of execution

Signature of reviewer

Title of reviewer



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

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APPROVAL

November 14, 2013

RECEIVED

NOV 20 2013

GNIWPCA ADMINISTRATION

Mr. Sidney J. Holbrook
Executive Director
Greater New Haven WPCA
260 East Street
New Haven, CT 06511

Re: CWF - PENDING
Preliminary Design Report Task Order
West River CSO Abatement Study

Dear Mr. Holbrook:

This office has reviewed the draft Task Order entitled "West River Combined Sewer Overflow (CSO) Abatement Study" dated October 31, 2013, between the Greater New Haven Water Pollution Control Authority and CH2MHill, and the accompanying Forms 5700-41 for the above referenced project. This Task Order is to develop a plan to reduce frequency, volume and duration of combined sewer overflows along the West River in New Haven. The cost breakdown of services is as follows:

Planning Services:

Direct Labor	\$46,085
Indirect Costs	\$78,345
Other Direct Costs	
Transportation	\$1,000
Zuvic Carr (WBE)	\$7,500
Zuvic Carr (MBE)	\$4,500
<u>Profit</u>	<u>\$12,371</u>
Total	\$ 149,800

CWF Eligible: \$ 149,800 (55% grant = \$ 82,390/no loan)

The Department of Energy and Environmental Protection (DEEP) hereby certifies that it has reviewed the subagreement and has determined that it is in compliance with the regulatory procedures contained in Sections 22a-482-4 (g) and 22a-482-4 (k) of the Regulations of Connecticut State Agencies. Approval is given for the amounts shown above as these are the amounts that pertain to the services to be provided under this project.

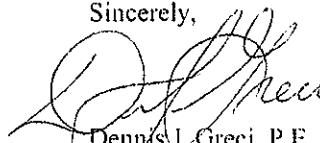
The approval by DEEP of an engineering agreement or amendment does not relieve the consulting engineer from the certified understanding that the subagreement price may be subject to downward renegotiation and/or recoupment where the cost and price data submitted have been determined, as a result of audit, not to have been complete, current and accurate as of the certified date. The Approval of this Task Order and the associated fees should not be interpreted as approval for additional grants funds. This approval will verify that any effort expended by your consultant for the approved services on or after the date of this letter will be considered as eligible for reimbursement under the terms and conditions of the Clean Water Fund once your funding application has been approved.

You are reminded that the Clean Water Fund MBE/WBE requirements are applicable to this approval. The goal for participation by subconsultants is 3.0% of the total approved contract amount for Minority Owned Business Enterprises (MBEs), and 5.0% of the total approved contract amount for Women Owned Business Enterprises (WBEs). The engineer is required to submit executed subagreements meeting or exceeding this goal within fifteen (15) days of executing the engineering contract or the date of this approval, whichever is later. No payments will be processed by DEEP for engineering services until these goals have been met and the appropriate executed subagreements have been submitted. Please submit one copy of each subagreement to Lee Rogers, DEEP Financial and Support Services Bureau, 79 Elm Street, Hartford CT 06106-5127.

This APPROVAL does not relieve you of the obligation to obtain any other authorizations as may be required by Federal, State or Local Laws or regulations.

If you have any questions regarding this matter, please contact Ivonne Hall at (860) 424-3754.

Sincerely,



Dennis J. Greci, P.E.
Supervising Sanitary Engineer
Planning & Standards Division
Bureau of Water Protection and Land Reuse

DG/igh

cc: Eric Muir, P.E. (CH2MHill)

E-copy: Tom Sgroi, P.E. (GNHWPCA)
Lee Rogers (DEEP)



CH2M HILL
100 Great Meadow Road, Suite 107
Wethersfield, CT 06109
Tel 860.560.8906
Fax 860.560.8904

August 13, 2013

Tom Sgroi, PE.
Director of Engineering
Greater New Haven Water Pollution Control Authority
260 East Street
New Haven, CT 06511

Subject: On Call Engineering Services
Hydraulic Model Update

Dear Tom:

Please find attached the Scope of Work and Budget for a Task Order to the AGREEMENT between the Greater New Haven Water Pollution Control Authority (GNHWPCA, or Authority) and CH2M HILL, Engineers (CH2M HILL) for professional engineering services regarding on-call engineering services for wastewater treatment and major pump stations, energy, value engineering, green technology, and GIS dated April, 26, 2010.

The purpose of this task order is to provide engineering services associated with an update of the Authority's hydraulic sewer model used in the preparation of the Long Term CSO Control Plan (LTCP). The scope of services described herein will deliver a hydraulic model that accurately represents current collection system conditions and is appropriate for supporting long-term planning and future design projects. The model updates and calibration are necessary to refine flow numbers for future pump station and treatment plant expansion design.

CH2M HILL appreciates this opportunity to assist the Authority on this important project. If you have any questions please do not hesitate to contact us.

Sincerely,

CH2M HILL

A handwritten signature in cursive script, reading "Eric Muir".

Eric Muir, P.E.
Project Manager

A handwritten signature in cursive script, reading "Brian Gackstatter".

Brian Gackstatter, P.E.
Vice President

GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY

Agreement for Professional Engineering Services *Regarding On-Call Services*

TASK ORDER SCOPE Hydraulic Modeling Update

Purpose

The following is a Task Order to the AGREEMENT between the Greater New Haven Water Pollution Control Authority (GNHWPCA, or Authority) and CH2M HILL, Engineers (CH2M HILL) for professional engineering services regarding on-call engineering services for wastewater treatment and major pump stations, energy, value engineering, green technology, and GIS dated April 26, 2010.

The purpose of this task order is to provide engineering services associated with an update of the Authority's hydraulic sewer model used in the preparation of the Long Term CSO Control Plan (LTCP) prescribed in Consent Order WC 5509 between the State of Connecticut and the Greater New Haven Water Pollution Control Authority.

The level of detail included in the existing hydraulic model, although adequate for Long-Term Control Planning, is not sufficient for detailed design of system improvements, including refined prediction of average and peak wet weather flows conveyed to the East Shore WPAF. During recent flow monitoring activities, it was found that the planning-level hydraulic modeling scenarios previously developed to support the Authority's Long-term Control Plan (LTCP) may differ than the conditions of the collection system as it exists today.

Because major capital projects (such as the Wet Weather Capacity Improvements) and their associated costs will be based on design information developed using the system model, it is imperative that the model be as up-to-date and accurate as possible for use as a detailed planning and design tool. The Preliminary Engineering Recommendations are based on the existing planning-level hydraulic model. The finalization of these recommendations requires the model updates and calibration activities described herein to confirm design parameters and the benefits of these recommendations.

The scope of services described herein will deliver a hydraulic model that accurately represents current collection system conditions and is appropriate for supporting long-term planning and future design projects. The model updates and calibration are necessary to refine flow numbers for future pump station and treatment plant expansion design.

Scope

This Task Order will provide services that:

- Update the hydraulic model to reflect current 2013 conditions in the collection system;
- Conduct a short-term, flow-monitoring program;
- Revise and verify the model to reflect current conditions; and,
- Prepare model scenarios for LTCP planning and design evaluations.

The scope of this Task Order consists of the following tasks:

- Task 1 – Project Management
- Task 2 – Hydraulic Model Update
- Task 3 – Hydraulic Modeling Report

Task 1—Project Management

Task 1.1 Project Management

The purpose of this task is to conduct the project management activities required to manage all technical, financial, and schedule aspects of this task order necessary to complete work on time, within budget, and of suitable quality. Activities include coordinating and facilitating team and client meetings, coordinating quality assurance, coordinating subcontractors, monitoring the progress of the work, and assembling all documents.

Task 2—Hydraulic Modeling Update

The Authority's collection system hydraulic model was originally developed in 1998 to support the CSO Long-Term Control Plan. The system-wide collection system hydraulic model was developed and calibrated for the Authority's Long-Term Control Plan Project (LTCP). This planning-level model was initially delivered in December 1998 and documented in LTCP Technical Memorandum #3. Sewer plan maps and as-built drawings were used to construct the model. The planning-level model was calibrated using several data sources collected in the late 1990s, and then verified with data collected in the 2008 Hydraulic Modeling Update. The following tasks will be provided to update the Hydraulic Model to 2013 conditions.

Task 2.1 Kickoff Meeting and Project Workshop

After the Notice to Proceed, CH2M HILL will conduct a kickoff workshop to begin the hydraulic model update. CH2M HILL will facilitate a project workshop with Authority staff to:

- Describe and charter the project goals and objective with Authority staff;
- Establish key milestones, project deliverables and their schedules;
- Identify CH2M HILL and Authority points of contact;
- Review pros and cons of SWMM based modeling programs including PCSWMM, XP SWMM,

InfoSWMM and Mike Urban (SWMM Engine)

- Begin coordinating data compilation

Following the kickoff meeting and project workshop, CH2M HILL will submit to the Authority a formal data request summarizing data needs to support hydraulic model improvements and verification. It is anticipated that these needs will include as-built drawings for pump stations, forcemains, and LTCP projects; pump curves and control logic; and recently collected flow monitoring data.

CH2M HILL will prepare a technical memorandum that summarizes the kickoff meeting, the proposed hydraulic model updates and the schedule plan for completion of the project.

Task 2.2 Model Migration to SWMM platform

CH2M HILL will migrate the existing MOUSE model to SWMM 5 model using an EPA SWMM based modeling program selected under Task 2.1. Significant changes due to different model platform includes:

- Subcatchment runoff model input will be converted from MOUSE time-area based model to SWMM default nonlinear reservoir runoff model.
- Dry weather input will be converted from population equivalent (PE) method in subcatchment of MOUSE model to average dry flow input to nodes of SWMM 5 model.
- MOUSE RDI input to SWMM RTK input

The migrated SWMM 5 model will be verified by comparing the modeling run results between the existing MOUSE model and migrated SWMM 5 model.

A technical memorandum will be prepared documenting the model migration and comparing run results during 2-year design storm. Scatter plots or charts comparing the existing model results with migrated model will be produced and attached to the memorandum for overflow rate of each active CSO outfall in 5 minute interval, influent flowrate at WWTP in 5 minute interval and pumping rate at three main pumping stations including Boulevard Pump Station, East Street Pump Station and Union Street Pump Station.

Task 2.3 Hydraulic Model Improvements

CH2M HILL will modify the planning-level hydraulic model to represent existing collection system conditions. CH2M HILL will review the Authority's GIS database and determine the extent of sewer network within the city of New Haven will be imported to the model in addition to the pipe network of the existing MOUSE model. The model will be modified with detailed information compiled for pump stations, force mains, storage tanks, regulators, collection system improvements and other system components that affect hydraulics. Field verification of pump station equipment and/or operations and other system components will be conducted, if necessary. Field inspection effort will be contingent upon completion of reviewing GIS database and assessment of model improvement needs. CH2M Hill has budgeted \$75,000 to cover the cost of required field investigations. Zuvic Carr (WBE) and Prime Engineering (MBE) will be utilized to

provide these services.

A data development step is required to define the hydraulic model data needs associated with each new project or modification in operations being input into the model. Data and information will be compiled and import to hydraulic model database.

A technical memorandum will be prepared describing hydraulic model improvements. Graphical and tabular summaries will be attached to the technical memorandum. This technical memo will be submitted to the Authority for review and comment and finalized when comments have been received.

Task 2.4 Short-Term Flow Monitoring Program

CH2M HILL will hire CSL Services to conduct a short-term flow monitoring program. The subcontractor will install, calibrate, and maintain flow metering devices at selected locations throughout the collection system. Collection system flow will be monitored for six weeks, with the option of extending metering on weekly basis. Data will be compiled and transmitted to CH2M HILL and the Authority for review.

For the monitoring program to be successful, a combination of small and large storms must be observed to provide adequate data for model calibration. If the range of intensities and duration are not sufficient for satisfactory model calibration (i.e. the system does reach its maximum capacity), additional monitoring after this period may be necessary.

Preliminary locations identified for flow meters are summarized in Table 1. These meters will be utilized along with the 32 meters currently installed through the Authority's CSO Flow Monitoring Program to collect flow metering data. Two rain gauges will also be deployed in drainage areas coincidental to the flow meters. It is assumed that the program will be conducted for 6 weeks and consist of 23 flow meters and 2 rain gauges. If necessary, the metering program can be extended for an additional cost of \$13,000 per week.

Table 1 – Proposed Meter Locations.

Flow Meter #	Location	Description
1	Mill River Interceptor @ Hamden Townline	Upstream flow from Hamden
2	Winchester Ave. @ Lander Street	Upstream flow from Hamden
3	Dixwell Ave. @ Cherry Ann Street	Upstream flow from Hamden
4	Sherman Ave. @ Whalley Ave.	Partially separated area around closed 008
5	Thorpe Drive Interceptor @ Hamden Townline	Upstream flow from Hamden
6	Whalley Ave. @ Pond Lily Ave.	Upstream flow from Woodbridge
7	Derby Ave. @ Ella T Grasso Blvd	Main trunk in 005 area
8	Whalley Ave. @ Boulevard	Boulevard Interceptor
9	Frontage Rd. @ Ella T Grasso Blvd	Main trunk in 004 area
10	Davenport Ave. near Ella T Grasso Blvd	Main trunk in 003 area
11	Lamberton Street near Ella T Grasso Blvd	Main Trunk in 002 area
12	Frontage Rd. @ State Street	Union Ave. PS, partially separated areas
13	State Street @ Frontage Rd.	Union Ave. PS, main CS trunk
14	Union Ave. @ Frontage Rd.	Union Ave. PS, partially separated area
15	Upstream of REG 012	Interceptor, upstream of 012 regulator
16	James Street upstream of Humphrey Street	State Street Interceptor from Hamden and Fair Haven
17	Wooward Street near ESWPAF	Flow from Morris Cove PS and East Haven
18	Water Street @ East Street	Interceptor, to E. St. PS
19	James Street @ Grand Ave.	Interceptor, upstream of REG 009
20	River Street @ Poplar Street	Interceptor, upstream of 016
21	Poplar Street @ River Street	Main trunk in 016 area
22	Front Street @ Pine Street	Interceptor, upstream of REG 019
23	Near Quinnipiac Bridge	Main trunk, partially separated area

The above list is preliminary. The final list will be established following consultation with Authority personnel.

Task 2.5 Model Calibration

Flow and rainfall data collected during the execution of Task 2.4 will be compiled with other system data for model recalibration. CH2M HILL will review the flow monitoring data to identify data that may also be useful in model calibration, such as pump station and WPAF flow meters. Time-series flow data at each monitoring location in the collection system will be summarized from the monitoring program or data collected by the Authority. This data will provide the basis for recalibrating the 2013 conditions model.

The hydraulic model will be prepared to simulate four scenarios: one dry weather flow (defined as seven days of flow without precipitation); and, three wet weather events with total rainfall greater than 0.5 inches. Rainfall derived inflow/infiltration (RDII) will be added to each separated sanitary sewer service

area outside New Heaven using RTK method which is an unit hydrograph method by estimating short-term, mid-term and long-term impacts of precipitation event to system inflow/infiltration conditions. RDII components will also be added to each pumping station within New Haven.

Dry weather flow pattern will be analyzed and generated using EPA's SSOAP tool box program. The seasonality of the dry weather flow pattern will be generated based on the average monthly dry weather flow at the WPAF.

Wet weather calibration will be performed by adjusting the effective areas that contribute stormwater runoff to the sewer system. Model simulations and calculations will be compared to data to assess the accuracy of the updated hydraulic model database in predicting current system operating conditions.

A QA/QC step will be required to debug major model construction issues and verify that the hydraulic model is able to successfully complete dry and wet weather simulations with reasonable results. This step will identify any model parameters that need to be further adjusted.

CH2M HILL will conduct this model calibration process collaboratively with the Authority through a series of workshops. CH2M HILL and Authority staff will collaborate on results and required model refinements to refine the accuracy of the model and plan for modeling runs conducted under Task 2.5. A total of three model calibration workshops will be conducted. Model parameters will be modified to improve the accuracy of calculations compared to data to a reasonable degree.

A technical memorandum will be prepared to summarize the model calibration process, including the results comparing model simulation result with flow metering data at each monitoring location during selected calibration events and long-term simulation results comparing seasonality of the dry weather flow between model simulation and WPAF influent flow.

Task 2.6 Hydraulic Analysis: Long-Term and Extreme Event Simulation

Up to five (5) model scenarios will be reconstructed using the verified model to simulate the LTCP for the current plan condition with a two-year design storm. The scenarios will include updates and calibrations to reflect current conditions as well as the planned components of the LTCP discussed in Task 2.7. Simulations of the plans will be performed and summarized for the Authority. A total of 6 model runs will be conducted; 1 existing plan, 5 various planning scenarios.

CH2M HILL will perform system optimization runs to reduce CSOs with calibrated 2013 conditions model during 2-year design storm. System optimization will be an iterative process with combinations of modifying regulator weir heights and/or real time control of tank and pumping station operations. Using CH2M HILL's simLink tool, generic algorithm will be used to automatically screen the optimization options. The optimization results will be summarized in a technical memorandum describing the processes and present results and recommendations to the authority.

Long-term hydraulic simulations with previously determined average year of rainfall will also be performed for existing conditions, and LTCP scenarios. The simulations will define how the proposed LTCP improvements affect maximized conveyance, and overflow frequency and volume on a "typical year" basis, as defined in the U.S. Environmental Protection Agency's CSO Control Policy.

To better identify maximum conveyance capacity, a model run will be performed of an extreme wet weather event with increasing rainfall using the calibrated 2013 conditions model. This simulation will provide an indication of how the system operates under extreme conditions, identifying constriction points, surcharge and flooding locations, and in-system storage.

A technical memorandum with appropriate graphics and tables will be prepared to describe the analysis. The technical memorandum will be submitted to the Authority for its review and comment. A final technical memorandum will then be submitted to the Authority.

Task 3—Hydraulic Modeling Report

CH2M HILL will prepare a Hydraulic Modeling report to document model development and model runs conducted for CSO Long Term Control Planning.

Task 3.1 Hydraulic Model Report Development

The report will document model development, calibration and model runs conducted for CSO Long Term Control Planning. The report will examine and document the baseline conditions, in terms of combined sewer overflows (CSOs) in 1997 under a two year storm event with corresponding CSOs based on previous planning model, and 2013 conditions based on calibrated modeling results of the improvements made under this Task Order. The report will also identify results of previously implemented LTCP projects.

The 2013 CSO volumes will be further compared to the predicted CSOs when future LTCP improvements are implemented. The report will analyze LTCP strategies including optimizing conveyance and in system storage through modifications of regulators, examining in system storage strategies, examining sewer separation strategies and examining green infrastructure.

Task 3.2 Cost Estimating

The predicted costs for the construction of the measures identified in the modeling report to eliminate CSOs from the two year design storm will be updated consistent with the approach defined in the Facilities Plan for maximizing flow to the East Shore WPAF.

Project Costs and Schedule

Project Cost

The lump sum costs for the Task Order are shown in Table 1, broken down by task. For services provided under this Task Order, costs have been calculated by CH2M HILL direct salaries, plus a percentage of direct salaries (overhead 170%), plus a fee percentage of 10% on labor. Expenses include direct expenses and outside services on a cost basis (no markup).

Costs associated with Traffic Control for field investigations and flow monitoring, Task 2.3 and 2.4, have been placed in Allowances totaling \$25,000. Cost associated with an additional 6 weeks of flow metering

has been placed in an Allowance totaling \$78,000. Total Allowances equal \$103,000.

A CT DEEP 5700 form is attached.

TABLE 1 Task Order Project Costs					
Task	CH2MHILL Labor	Sub-Contracts	Allowance	Expense	Task Total
PROJECT MANAGEMENT					
Task 1.1 Project Management	\$73,608			\$5,000	\$78,608
Sub Total	\$73,608			\$5,000	\$78,608
HYDRAULIC MODEL UPDATE					
Task 2.1 Kickoff Meeting and Project workshop	\$19,816				\$19,816
Task 2.2 Model Migration to SWMM Platform	\$53,983			\$2,000	\$55,983
Task 2.3 Hydraulic Model Improvements	\$58,735	\$75,000	\$7,000	\$2,000	\$142,735
Task 2.4 Short-Term Flow Monitoring Program	\$46,397	\$63,600	\$96,000	\$2,000	\$219,997
Task 2.5 Model Calibration	\$143,249			\$2,000	\$145,249
Task 2.6 Hydraulic Analysis	\$139,638			\$2,000	\$141,638
Sub Total	\$461,818	\$138,600	\$103,000	\$10,000	\$713,418
HYDRAULIC MODELING REPORT					
Task 3.1 Hydraulic Model Report Development	\$60,362	\$5,000			\$65,362
Task 3.2 Cost Estimating	\$13,721				\$13,721
Sub Total	\$74,083	\$5,000			\$79,083
Grand Total	\$609,509	\$161,600	\$103,000	\$15,000	\$871,109

Schedule

Upon approval of the task order, CH2M HILL will complete the construction contract documents within 9 months from notice to proceed.

Cost or Price Summary for Professional Services Agreements

FORM

State of Connecticut - Department of Environmental Protection

5700-41

Water Management Bureau - Clean Water Fund Program

Greater New Haven Water Pollution Control Authority - Hydraulic Modeling Update

1. Grantee - Greater New Haven Water Pollution Control Authority		2. Grant Number -		
3, 5. Name and Address of Contractor or Subcontractor CH2M HILL 100 Great Meadow Road Suite 107 Wethersfield, CT 06109		4. Subagreement Date		
		6. Services to be Furnished GNHWPCA Hydraulic Modeling Update		
7. Direct Labor (Specify labor categories)	Estimated Hours	Hourly Rate	Estimated Cost	TOTALS
Project Director	190	\$80.00	\$15,200	
Project Manager	384	\$63.00	\$24,192	
Senior Technical Specialist	248	\$68.00	\$16,864	
Senior Project Engineer	140	\$55.00	\$7,700	
Engineer	1080	\$40.00	\$43,200	
Staff Engineer	140	\$34.00	\$4,760	
Senior Technician	325	\$30.00	\$9,750	
Senior Admin. Assistant	200	\$26.00	\$5,200	
Senior CAD Operator	100	\$35.00	\$3,500	
Senior Computer Modeler	582	\$60.00	\$34,920	
Computer Modeler	792	\$48.00	\$38,016	
Senior Cost Estimator	40	\$48.00	\$1,920	
DIRECT LABOR TOTAL:				\$205,222
8. Indirect Costs (Specify indirect cost pools)	Rate	x Base	Estimated Cost	
Labor Overhead	1.700	\$205,222	\$348,877	
INDIRECT COSTS TOTAL:				\$348,877
9. Other Direct Costs			Estimated Costs	
a. Travel				
(1) Transportation			\$5,000	
(2) Per Diem			\$5,000	
TRAVEL TOTAL:				\$10,000
b. Printing, Materials, Supplies (Specify categories)	Quantity	Cost	Subtotal	
(1) Field expense, relocations and allowances			\$5,000	
(2) Postage/FEDEX				
(3) Printing/Photos/Reproduction				
(4) Miscellaneous				
EQUIPMENT TOTAL:				\$5,000
c. Subcontracts (Specify firm & category)				
CSL Services			\$63,600	
Advanced Reproduction (WBE)			\$5,000	
Prime Engineering (MBE)			\$30,000	
Zuvic Carr (WBE)			\$45,000	
SUBCONTRACTS TOTAL:				\$143,600
d. Other (Specify categories)				
Traffic Control Allowance			\$25,000	
Flow Metering Extension Allowance			\$78,000	
OTHER TOTAL:				\$103,000
OTHER DIRECT COSTS TOTAL:				\$261,600
10. TOTAL ESTIMATED COST				\$815,699
11. FIXED FEE OR PROFIT				\$55,410
12. TOTAL PRICE Check one: <input type="checkbox"/> Cost plus fixed fee <input checked="" type="checkbox"/> Lump Sum <input type="checkbox"/> Other				\$871,109

14. CONTRACTOR INFORMATION

14a. Has a federal agency certified state or local agency performed any review of your accounts or records in connection with any other Federal grant or contract within the past 12 months?

☐ No

☐ Yes (Write name, address and telephone number of reviewing office below).

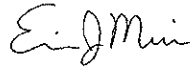
14b. This summary conforms with the following cost principals:

14c.

This proposal is submitted for use in connection with and in response to a proposal for a Hydraulic Modeling Update for the Greater New Haven Water Pollution Control Authority. This is to certify the best of my knowledge and belief that the cost and pricing data summarized herein are complete, current and accurate as of August 13, 2013, and that a financial management capability exists to fully and accurately account for the financial transactions under this project. I further certify that I understand that the subagreement price may be subject to downward renegotiation and/or recoupment where the above cost and pricing data have been determined, as a result of audit, not to have been complete, current and accurate as of the date above.

August 13, 2013

Date of execution



Signature of proposer

Project Manager

Title of proposer

15. GRANTEE REVIEW

I certify that I have reviewed the cost/price summary set forth herein and the proposed costs/price appear acceptable for subagreement award.

Date of execution

Signature of reviewer

Title of reviewer

16. DEP REVIEWER

Date of execution

Signature of reviewer

Title of reviewer



Work Order COLL-67322

Collections
Printed 12/18/2013 - 7:00 AM**Maintenance Details**

Requested By: Ryan Harrold on 12/17/2013 8:30:00 AM
 Problem: Sewer Backup (SEWER BACKUP)
 Procedure: Backup Response (BACKUP_RESPONSE)
 Target: 12/17/2013 (1) hr
 Priority/Type: Emergency/Safety/Compliance / Corrective
 Supervisor: Nasse, Rich
 Shop: OMI
 Hamden
 HDCUSTOM
 91 CIRCULAR AVE
 (HDCUSTOM-017314)
 Contact: Ryan Harrold
 Phone: (203) 466-5260

Reason: Sewer Backup Jason Littlefield Hamden Public works 203-287-2600 Circular @ Scott Jason stated that the sewer lateral heads out to Scott notified Rich Nasse.

☐ Warranty ☐ Shutdown ☐ Lockout ☐ Attach ☐ Charge

Tasks

#	Description	Rating	Meas.	Initials	Failed	Complete
FOLLOW TRAFFIC CONTROL PROCEDURES						
10	Arrive at location. Follow safety procedures!			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	Check main line in street to verify if flowing.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FOLLOW CORRECT MANHOLE LIFTING PROCEDURE						
30	Jet line, opening up and downstream manhole covers.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40	If available, notify homeowner/business owner of the current conditions.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
50	Record all information on work order and report back to supervisor.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
60	HDX04P0436 [HDX04P0436] HDX04P0436 Comments: This line was checked and found to be ok. The crew jetted the line with no change. Hamden DPW was contacted to call a drain cleaning company.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
70	HDX04P0135 Comments: This line was checked for flow in case the map was wrong and the lateral came out here. This line was ok.			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Labor

Labor	Account	Work Date	Start	End	Reg Hrs	OT Hrs	Other Hrs
Alex, Mark	01.1400.000.5010	12/17/2013			1	0	0
Nasse, Rich	01.1400.000.5010	12/18/2013			0.25	0	0
Wolff, Daniel	01.1400.000.5010	12/17/2013			1	0	0

Labor Report

Completed: 12/17/2013 5:35:00 AM Failure: LAT BLOCKAGE / Lateral Blockage

Report: Crew checked the line and found it to be ok. The crew jetted the line with no change. Hamden DPW was notified to call a drain cleaning company.

12/17/2013

Compliance Status of FPE's with Respect to the 7/1/2011 Requirements of CT DEP General Permit for the Discharge of Wastewater Associated with Food Preparation Establishments:

Compliant? :	Number of FPE's:	Number of Active Class 3 and 4 FPE's:	Number of Class 1 and 2 FPE's:	Number of Diminimus Discharge FPE's:
Yes	725	725		
No	29	29		
N/A	223		74	149

754 Number of Active FPE's (Class 3 and 4 only)

725 Number of Active FPE's in compliance with the CT DEP general permit

96.2% Percent of Active FPE's in compliance with the CT DEP general permit

Note 1: Figures above do not include FPE's that are recorded as inactive-closed, inactive-opening, inactive-remodeling, out of business and/or replaced, on septic system, or Off Inspection List for whatever reason.

Note 2: Not all class 1 and class 2 FPE's are in the database.



CB 12-17-13 01961

Greater New Haven Water Pollution Control Authority
260 East Street New Haven, CT 06511
203.466.5280 p 203 772.1564 f www.gnhwpca.com

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

June 20, 2013

Khadija Hussein
Owner
Hamden Deli
891 Dixwell Avenue
Hamden, CT 06514-5040

Dear Mr. Khadija Hussein;

You are being asked to bring the Hamden Deli, 891 Dixwell Avenue, Hamden, CT, into compliance with:

- The Connecticut Department of Energy and Environmental Protection's General Permit for the Discharge of Wastewater Associated With Food Preparation Establishments, Section 5 (b) which requires the installation of an Outdoor In-Ground Trap/Interceptor or an Automatic Grease Recovery unit (AGRU).

An inspection at the Hamden Deli on 06/20/2013 revealed the following finding:

Food is being cooked on a stove top and the pots and pans used are washed in a 3-bay sink that discharges to the sewer without pre-treatment of the wastewater. This is a direct violation of the promise you made when you requested a waiver of pre-treatment requirements on January 1, 2013.

The Greater New Haven Water Pollution Control Authority (GNHWPCA) directs that you immediately:

1. Immediately cease cooking on the stove top and washing pot and pans in the 3-bay sink.
2. Prepare and submit plans for the installation of the appropriate pre-treatment to bring the establishment into compliance with the CT DEEP general permit.

The plans shall include:

- a) A description of the proposed pre-treatment equipment.
- b) Work practices that will be used to maintain the pre-treatment equipment.

You are further informed by this letter that the GNHWPCA revokes the waiver of pre-treatment requirements that the establishment was previously allowed to operate under.

You may contact Jesse Whittemore of OMI at (203) 466-5277 ext. 274 for assistance.

Be advised that continued non-compliance will result in the GNHWPCA issuing a Notice of Violation. Failure to correct a violation may result in a fine of one hundred dollars (\$350.00) per day and could subject your discharge to disconnection and sealing from GNHWPCA's sewer system; court ordered injunction, as well as the criminal sanction of conviction and fine. Also be advised that GNHWPCA may assess your discharge at a higher rate than residential customers in accordance with GNHWPCA approved rate formulas.

Sincerely,

Gary Zrelak
Director of Operations

CC: Jesse Whittemore, Industrial Pretreatment Coordinator
Lynn Fox, Chief of Environmental Services, QVHD, 1151 Hartford Turnpike, North Haven, CT 06473

Enclosures: CT DEP General Permit for the Discharge of Wastewater Associated With Food Preparation Establishments (Issuance Date: September 30, 2005)

Your Request for waiver of pre-treatment requirements dated 1/7/13

Bruce Kirkland

From: Bruce Kirkland [bkirkland@ableengineeringllc.com]
Sent: Monday, February 06, 2012 12:21 PM
To: 'Gary Zrelak'
Cc: 'Noelle Vanwolvelaar'
Subject: PMP Implementation
Attachments: PMP Implementation.docx; PMP Implementation.xlsx; Hot Spots.xlsx

Gary, I have completed my review of the Hot Spot data and have developed a strategy to include that data in the Procedure to Prioritize Areas for Inspection. I have attached the Updated Procedure which also incorporates the changes that we discussed at our last meeting. I have also attached two spreadsheets.

- PMP Implementation includes the following tabs
 - Colors – data used to prioritize inspection areas (in color)
 - No Colors – data used to prioritize inspection areas (in black and white)
 - Primary – primary inspection areas
 - Secondary – secondary inspection areas
 - Tertiary – remaining inspection areas
- Hot Spots includes the following tabs
 - Summary – GNHWPCA hot spots
 - New Haven – New Haven hot spots
 - Hamden – Hamden hot spots
 - East Haven – East Haven hot spots
 - Woodbridge – Woodbridge hot spots

I am available to meet with you this week (tomorrow, Wednesday or Thursday) to review the attached information prior to our meeting with the Collections and Engineering staffs. Please let me know if any of those days work for you.
Thanks, Bruce.



Work Order COLL-63429

Collections
Printed 12/18/2013 - 9:11 AM (Duplicate Copy)

Maintenance Details

Requested: 6/29/2013 9:00:00 PM
Taken By: Nasse, Rich
Problem: HOT SPOT CLEANING
(HOT SPOT CLEANING)
Procedure: NHV Eastern St
(NHV_EASTRNST)
Reason: NHV Eastern St

Target: 7/8/2013 (1) hr
Priority/Type: / Preventive
Supervisor: Nasse, Rich
Shop: OMI

New Haven
NHCUSTOM

Contact:
Phone:

☐ Warranty ☐ Shutdown ☐ Lockout ☐ Attach ☐ Charge

Tasks

#	Description	Rating	Meas.	Initials	Failed	Complete
10	NQL02P0283 Eastern St			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	NQL02P0284			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30	NQL02P0285			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40	NQL02P0286			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Labor

Labor	Account	Work Date	Start	End	Reg Hrs	OT Hrs	Other Hrs
Alex, Mark	01.1400.000.5010	7/8/2013			1	0	0
John Vuolo	01.1400.000.5010	7/8/2013			1	0	0
Nasse, Rich	01.1400.000.5010	7/29/2013			0.25	0	0

Labor Report

Completed: 7/8/2013 11:13:00 AM Failure: /

Report: crew cleaned the hot spot.

315 Eastern SSO



Work Order COLL-63547

Collections
Printed 12/18/2013 - 8:27 AM (Duplicate Copy)

Maintenance Details

Requested: 7/5/2013 9:00:00 PM

Target: 7/17/2013 (1) hr

East Haven

Taken By: Nasse, Rich

Priority/Type: / Preventive

EHCUSTOM

Problem: HOT SPOT CLEANING
(HOT SPOT CLEANING)

Supervisor: Nasse, Rich

Shop: OMI

Contact:

Procedure: EHV Prospect PI Ext
(EHV_PROSPPLEXT)

Phone:

Reason: EHV Prospect PI Ext

☐ Warranty ☐ Shutdown ☐ Lockout ☐ Attach ☐ Charge

Tasks

#	Description	Rating	Meas.	Initials	Failed	Complete
10	EUL07P0163			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	EUL07P0164			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30	EUL07P0341			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Labor

Labor	Account	Work Date	Start	End	Reg Hrs	OT Hrs	Other Hrs
Alex, Mark	01.1400.000.5010	7/17/2013			1	0	0
Ernie Trujillo	01.1400.000.5010	7/17/2013			1	0	0
Nasse, Rich	01.1400.000.5010	7/17/2013			0.25	0	0

Labor Report

Completed: 7/17/2013 12:38:00 PM Failure: / Meter(s): 15
Report: crew cleaned the hot spot.

Proto Drive SSO



Work Order COLL-65588

 Collections
 Printed 12/18/2013 - 9:02 AM

Maintenance Details

Requested: 10/5/2013 9:00:00 PM Target: 10/8/2013 (3) hrs
 Taken By: Nasse, Rich Priority/Type: / Preventive
 Problem: HOT SPOT CLEANING (HOT SPOT CLEANING) Supervisor: Nasse, Rich
 Procedure: NHV Eastern St (NHV_EASTRNST) Shop: OMI
 Reason: NHV Eastern St

 New Haven
 NHCUSTOM

 Contact:
 Phone:

☐ Warranty ☐ Shutdown ☐ Lockout ☐ Attach ☐ Charge

Tasks

#	Description	Rating	Meas.	Initials	Failed	Complete
10	NQL02P0283 Eastern St			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	NQL02P0284			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30	NQL02P0285			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40	NQL02P0286			RN	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Labor

Labor	Account	Work Date	Start	End	Reg Hrs	OT Hrs	Other Hrs
Laggis, William	01.1400.000.5010	10/17/2013			3	0	0
Nasse, Rich	01.1400.000.5010	10/30/2013			0.25	0	0
Pantera, Vinny	01.1400.000.5010	10/17/2013			3	0	0

Labor Report

Completed: 10/18/2013 8:17:00 AM Failure: /

Report: crew cleaned the hot spot several times. this line has backed up several times in the past few weeks in different locations.

315 Eastern Circle SSO

InfoSWMM and Mike Urban (SWMM Engine)

- Begin coordinating data compilation

Following the kickoff meeting and project workshop, CH2M HILL will submit to the Authority a formal data request summarizing data needs to support hydraulic model improvements and verification. It is anticipated that these needs will include as-built drawings for pump stations, forcemains, and LTCP projects; pump curves and control logic; and recently collected flow monitoring data.

CH2M HILL will prepare a technical memorandum that summarizes the kickoff meeting, the proposed hydraulic model updates and the schedule plan for completion of the project.

Task 2.2 Model Migration to SWMM platform

CH2M HILL will migrate the existing MOUSE model to SWMM 5 model using an EPA SWMM based modeling program selected under Task 2.1. Significant changes due to different model platform includes:

- Subcatchment runoff model input will be converted from MOUSE time-area based model to SWMM default nonlinear reservoir runoff model.
- Dry weather input will be converted from population equivalent (PE) method in subcatchment of MOUSE model to average dry flow input to nodes of SWMM 5 model.
- MOUSE RDI input to SWMM RTK input

The migrated SWMM 5 model will be verified by comparing the modeling run results between the existing MOUSE model and migrated SWMM 5 model.

A technical memorandum will be prepared documenting the model migration and comparing run results during 2-year design storm. Scatter plots or charts comparing the existing model results with migrated model will be produced and attached to the memorandum for overflow rate of each active CSO outfall in 5 minute interval, influent flowrate at WWTP in 5 minute interval and pumping rate at three main pumping stations including Boulevard Pump Station, East Street Pump Station and Union Street Pump Station.

Task 2.3 Hydraulic Model Improvements

CH2M HILL will modify the planning-level hydraulic model to represent existing collection system conditions. CH2M HILL will review the Authority's GIS database and determine the extent of sewer network within the city of New Haven will be imported to the model in addition to the pipe network of the existing MOUSE model. The model will be modified with detailed information compiled for pump stations, force mains, storage tanks, regulators, collection system improvements and other system components that affect hydraulics. Field verification of pump station equipment and/or operations and other system components will be conducted, if necessary. Field inspection effort will be contingent upon completion of reviewing GIS database and assessment of model improvement needs. CH2M Hill has budgeted \$75,000 to cover the cost of required field investigations. Zuvic Carr (WBE) and Prime Engineering (MBE) will be utilized to

provide these services.

A data development step is required to define the hydraulic model data needs associated with each new project or modification in operations being input into the model. Data and information will be compiled and import to hydraulic model database.

A technical memorandum will be prepared describing hydraulic model improvements. Graphical and tabular summaries will be attached to the technical memorandum. This technical memo will be submitted to the Authority for review and comment and finalized when comments have been received.

Task 2.4 Short-Term Flow Monitoring Program

CH2M HILL will hire CSL Services to conduct a short-term flow monitoring program. The subcontractor will install, calibrate, and maintain flow metering devices at selected locations throughout the collection system. Collection system flow will be monitored for six weeks, with the option of extending metering on weekly basis. Data will be compiled and transmitted to CH2M HILL and the Authority for review.

For the monitoring program to be successful, a combination of small and large storms must be observed to provide adequate data for model calibration. If the range of intensities and duration are not sufficient for satisfactory model calibration (i.e. the system does reach its maximum capacity), additional monitoring after this period may be necessary.

Preliminary locations identified for flow meters are summarized in Table 1. These meters will be utilized along with the 32 meters currently installed through the Authority's CSO Flow Monitoring Program to collect flow metering data. Two rain gauges will also be deployed in drainage areas coincidental to the flow meters. It is assumed that the program will be conducted for 6 weeks and consist of 23 flow meters and 2 rain gauges. If necessary, the metering program can be extended for an additional cost of \$13,000 per week.

Table 1 – Proposed Meter Locations.

Flow Meter #	Location	Description
1	Mill River Interceptor @ Hamden Townline	Upstream flow from Hamden
2	Winchester Ave. @ Lander Street	Upstream flow from Hamden
3	Dixwell Ave. @ Cherry Ann Street	Upstream flow from Hamden
4	Sherman Ave. @ Whalley Ave.	Partially separated area around closed 008
5	Thorpe Drive Interceptor @ Hamden Townline	Upstream flow from Hamden
6	Whalley Ave. @ Pond Lily Ave.	Upstream flow from Woodbridge
7	Derby Ave. @ Ella T Grasso Blvd	Main trunk in 005 area
8	Whalley Ave. @ Boulevard	Boulevard Interceptor
9	Frontage Rd. @ Ella T Grasso Blvd	Main trunk in 004 area
10	Davenport Ave. near Ella T Grasso Blvd	Main trunk in 003 area
11	Lamberton Street near Ella T Grasso Blvd	Main Trunk in 002 area
12	Frontage Rd. @ State Street	Union Ave. PS, partially separated areas
13	State Street @ Frontage Rd.	Union Ave. PS, main CS trunk
14	Union Ave. @ Frontage Rd.	Union Ave. PS, partially separated area
15	Upstream of REG 012	Interceptor, upstream of 012 regulator
16	James Street upstream of Humphrey Street	State Street Interceptor from Hamden and Fair Haven
17	Wooward Street near ESWPAF	Flow from Morris Cove PS and East Haven
18	Water Street @ East Street	Interceptor, to E. St. PS
19	James Street @ Grand Ave.	Interceptor, upstream of REG 009
20	River Street @ Poplar Street	Interceptor, upstream of 016
21	Poplar Street @ River Street	Main trunk in 016 area
22	Front Street @ Pine Street	Interceptor, upstream of REG 019
23	Near Quinnipiac Bridge	Main trunk, partially separated area

The above list is preliminary. The final list will be established following consultation with Authority personnel.

Task 2.5 Model Calibration

Flow and rainfall data collected during the execution of Task 2.4 will be compiled with other system data for model recalibration. CH2M HILL will review the flow monitoring data to identify data that may also be useful in model calibration, such as pump station and WPAF flow meters. Time-series flow data at each monitoring location in the collection system will be summarized from the monitoring program or data collected by the Authority. This data will provide the basis for recalibrating the 2013 conditions model.

The hydraulic model will be prepared to simulate four scenarios: one dry weather flow (defined as seven days of flow without precipitation); and, three wet weather events with total rainfall greater than 0.5 inches . Rainfall derived inflow/infiltration (RDII) will be added to each separated sanitary sewer service

area outside New Heaven using RTK method which is an unit hydrograph method by estimating short-term, mid-term and long-term impacts of precipitation event to system inflow/infiltration conditions. RDII components will also be added to each pumping station within New Haven.

Dry weather flow pattern will be analyzed and generated using EPA's SSOAP tool box program. The seasonality of the dry weather flow pattern will be generated based on the average monthly dry weather flow at the WPAF.

Wet weather calibration will be performed by adjusting the effective areas that contribute stormwater runoff to the sewer system. Model simulations and calculations will be compared to data to assess the accuracy of the updated hydraulic model database in predicting current system operating conditions.

A QA/QC step will be required to debug major model construction issues and verify that the hydraulic model is able to successfully complete dry and wet weather simulations with reasonable results. This step will identify any model parameters that need to be further adjusted.

CH2M HILL will conduct this model calibration process collaboratively with the Authority through a series of workshops. CH2M HILL and Authority staff will collaborate on results and required model refinements to refine the accuracy of the model and plan for modeling runs conducted under Task 2.5. A total of three model calibration workshops will be conducted. Model parameters will be modified to improve the accuracy of calculations compared to data to a reasonable degree.

A technical memorandum will be prepared to summarize the model calibration process, including the results comparing model simulation result with flow metering data at each monitoring location during selected calibration events and long-term simulation results comparing seasonality of the dry weather flow between model simulation and WPAF influent flow.

Task 2.6 Hydraulic Analysis: Long-Term and Extreme Event Simulation

Up to five (5) model scenarios will be reconstructed using the verified model to simulate the LTCP for the current plan condition with a two-year design storm. The scenarios will include updates and calibrations to reflect current conditions as well as the planned components of the LTCP discussed in Task 2.7. Simulations of the plans will be performed and summarized for the Authority. A total of 6 model runs will be conducted; 1 existing plan, 5 various planning scenarios.

CH2M HILL will perform system optimization runs to reduce CSOs with calibrated 2013 conditions model during 2-year design storm. System optimization will be an iterative process with combinations of modifying regulator weir heights and/or real time control of tank and pumping station operations. Using CH2M HILL's simLink tool, generic algorithm will be used to automatically screen the optimization options. The optimization results will be summarized in a technical memorandum describing the processes and present results and recommendations to the authority.

Long-term hydraulic simulations with previously determined average year of rainfall will also be performed for existing conditions, and LTCP scenarios. The simulations will define how the proposed LTCP improvements affect maximized conveyance, and overflow frequency and volume on a "typical year" basis, as defined in the U.S. Environmental Protection Agency's CSO Control Policy.

To better identify maximum conveyance capacity, a model run will be performed of an extreme wet weather event with increasing rainfall using the calibrated 2013 conditions model. This simulation will provide an indication of how the system operates under extreme conditions, identifying constriction points, surcharge and flooding locations, and in-system storage.

A technical memorandum with appropriate graphics and tables will be prepared to describe the analysis. The technical memorandum will be submitted to the Authority for its review and comment. A final technical memorandum will then be submitted to the Authority.

Task 3—Hydraulic Modeling Report

CH2M HILL will prepare a Hydraulic Modeling report to document model development and model runs conducted for CSO Long Term Control Planning.

Task 3.1 Hydraulic Model Report Development

The report will document model development, calibration and model runs conducted for CSO Long Term Control Planning. The report will examine and document the baseline conditions, in terms of combined sewer overflows (CSOs) in 1997 under a two year storm event with corresponding CSOs based on previous planning model, and 2013 conditions based on calibrated modeling results of the improvements made under this Task Order. The report will also identify results of previously implemented LTCP projects.

The 2013 CSO volumes will be further compared to the predicted CSOs when future LTCP improvements are implemented. The report will analyze LTCP strategies including optimizing conveyance and in system storage through modifications of regulators, examining in system storage strategies, examining sewer separation strategies and examining green infrastructure.

Task 3.2 Cost Estimating

The predicted costs for the construction of the measures identified in the modeling report to eliminate CSOs from the two year design storm will be updated consistent with the approach defined in the Facilities Plan for maximizing flow to the East Shore WPAF.

Project Costs and Schedule

Project Cost

The lump sum costs for the Task Order are shown in Table 1, broken down by task. For services provided under this Task Order, costs have been calculated by CH2M HILL direct salaries, plus a percentage of direct salaries (overhead 170%), plus a fee percentage of 10% on labor. Expenses include direct expenses and outside services on a cost basis (no markup).

Costs associated with Traffic Control for field investigations and flow monitoring, Task 2.3 and 2.4, have been placed in Allowances totaling \$25,000. Cost associated with an additional 6 weeks of flow metering

has been placed in an Allowance totaling \$78,000. Total Allowances equal \$103,000.

A CT DEEP 5700 form is attached.

TABLE 1 Task Order Project Costs					
Task	CH2MHILL Labor	Sub- Contracts	Allowance	Expense	Task Total
PROJECT MANAGEMENT					
Task 1.1 Project Management	\$73,608			\$5,000	\$78,608
Sub Total	\$73,608			\$5,000	\$78,608
HYDRAULIC MODEL UPDATE					
Task 2.1 Kickoff Meeting and Project workshop	\$19,816				\$19,816
Task 2.2 Model Migration to SWMM Platform	\$53,983			\$2,000	\$55,983
Task 2.3 Hydraulic Model Improvements	\$58,735	\$75,000	\$7,000	\$2,000	\$142,735
Task 2.4 Short-Term Flow Monitoring Program	\$46,397	\$63,600	\$96,000	\$2,000	\$219,997
Task 2.5 Model Calibration	\$143,249			\$2,000	\$145,249
Task 2.6 Hydraulic Analysis	\$139,638			\$2,000	\$141,638
Sub Total	\$461,818	\$138,600	\$103,000	\$10,000	\$713,418
HYDRAULIC MODELING REPORT					
Task 3.1 Hydraulic Model Report Development	\$60,362	\$5,000			\$65,362
Task 3.2 Cost Estimating	\$13,721				\$13,721
Sub Total	\$74,083	\$5,000			\$79,083
Grand Total	\$609,509	\$161,600	\$103,000	\$15,000	\$871,109

Schedule

Upon approval of the task order, CH2M HILL will complete the construction contract documents within 9 months from notice to proceed.